

germinate seed. The dead timber is so dry that fires in the woods are hard to control, and considerable damage is being done by them.—*Report of voluntary observer.*

Lead Hill, Boone Co., Ark., 30th: the weather is dry and crops in general are in need of rain.—*Report of voluntary observer.*

Tuscarora, Elko Co., Nev., 30th: the weather during the month has been exceedingly dry and windy. The grass on the range is beginning to show signs of drying up. The Owyhee River is dry, and there is no snow of any account on the mountains. A hard time on stock is feared.

Beowawe, Eureka Co., Nev., 30th: the Humboldt River is lower than it has ever been at this time of the year, and there is no snow on the mountains. Hundreds of acres of barley in this county are suffering from drought.—*Report of Nevada State Weather Service.*

## SUN SPOTS.

Haverford College Observatory, Pa. (observed by Mr. H. V. Gummere):

Date, April, 1889.	Number of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Faculae.		Remarks.
	Groups.	Spots.	Groups.	Spots.	Groups.	Spots.	Groups.	Spots.	Groups.	Faculae.	
4, 9 a. m. ....	1	1	0	0	0	0	1	1	0	0	Definition good.
5, 11 a. m. ....	0	0	0	0	0	0	1	1	0	0	Definition poor.
8, 3 p. m. ....	0	0	0	0	0	0	1	1	0	0	Definition poor.
9, 11 a. m. ....	0	0	0	0	0	0	1	1	0	0	Definition good.
10, 11 a. m. ....	0	0	0	0	0	0	1	1	0	0	Definition good.
11, 11 a. m. ....	1	4	0	0	0	0	1	4	0	2	Definition poor.
13, 12 m. ....	0	0	0	0	0	0	0	0	0	0	Definition good. Clouds prevented observation of faculae.
15, 11 a. m. ....	0	0	0	0	0	0	0	0	0	0	Definition poor.
23, 12 m. ....	0	0	0	0	0	0	0	0	1	1	Definition poor.
24, 10 a. m. ....	0	0	0	0	0	0	0	0	2	4	Definition good.
30, 9 a. m. ....	0	0	0	0	0	0	0	0	0	0	Definition poor.

Mr. John W. James, Riley, McHenry Co., Ill.: one, 20,000 miles diameter, seen 1st; on sun's meridian 6th, 10th, much smaller, probably vanished before reaching west edge; none others seen. Mr. M. A. Veeder, Lyons, Wayne Co., N. Y.: 3d, a spot of considerable size was seen about two days removed from the sun's eastern limb. This spot continued until the 11th when it faded out as it was approaching the western limb. 11th, a group of small spots was seen near the eastern limb. This group was not discovered on the day preceding, nor was it seen on the 13th. 19th, a group of bright faculae appeared by rotation. 27th, an extensive group of faculae was seen near the eastern limb in the location of the spot that was seen as above described on the 3d. Mr. H. W. Govey, North Lewisburgh, Champaign Co., Ohio: sun spots were observed on the 2d, 3d, 5th, 7th, 8th, 10th.

## VERIFICATIONS.

The percentages of the official forecasts of the Signal Service for April, 1889, were not completed in time to be published in this issue of the REVIEW.

Percentages of local verifications of weather and temperature signals as reported by directors of the various State Weather Services for April, 1889.

States.	Weather.	Temperature.	States.	Weather.	Temperature.
Illinois .....	86.4	86.2	New York .....	84.0	88.0
Indiana .....	83.4	86.8	North Carolina .....	79.3	74.6
Kansas .....	92.3	92.3	Ohio .....	77.0	84.0
Michigan .....	81.0	81.5	Pennsylvania .....	82.0	86.0
Minnesota .....	77.0	78.0	South Carolina .....	84.5	88.5
Nebraska .....	86.6	86.5	Tennessee .....	84.0	91.9
New Jersey .....	77.7	90.0			

NOTE.—In the table of percentages of official indications verified for February, 1889, published in the REVIEW for March, 1889, the percentage of verifications for Washington Territory should be 74.6.

## STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts are republished from reports for April, 1889, of the directors of the various state weather services:

## ALABAMA.

The average temperature for the month was 2.7 above the normal. The cold days were the 6th and 7th, and the maximum temperature occurred on the 11th and 12th. The cold days were accompanied by northwest winds that were so dry and blighting that tender plants in the gardens and fields suffered considerably. In some sections the cotton was so much damaged it was deemed best to replant.

The rainfall was 1.98 below the average, and the soil has become quite dry. Farmers complain very much about the dry condition of the atmosphere and the withering of the crops on account of the lack of rain.

## SUMMARY.

*Temperature.*—Monthly mean, 63.2; highest monthly mean, 68.7, at Tuscaloosa; lowest monthly mean, 57.5, at Butler and Florence; maximum, 91, at Citronelle, 23d; minimum, 32, at Valley Head, 7th; range for state, 59; greatest local monthly range, 53, at Wiggins; least local monthly range, 33, at Columbiana and Troy.

*Precipitation.*—Average for the state, 3.62; greatest, 6.62, at Greensborough; least, 1.40, at Elkmont.

*Wind.*—Prevailing directions, northwest and west.—*P. H. Mell, Signal Corps, Auburn, director.*

## ARKANSAS.

## SUMMARY.

*Temperature.*—Monthly mean, 64.4; highest monthly mean, 69.6, at Russellville; lowest monthly mean, 61.7, at Heber, Osceola, and Ozone; maximum, 90, at Jimtown, Ind. T., 5th, and at Lead Hill, 2d; minimum, 33, at Little Rock; range for state, 57; greatest local monthly range, 65, at Jimtown, Ind. T., and Texarkana; least local monthly range, 33, at Lonoke.

*Precipitation.*—Average for the state, 2.84; greatest, 6.54, at Alexander; least, 0.50, at Heber.—*Prof. John C. Branner, Little Rock, director; W. U. Simons, Sergeant, Signal Corps, assistant.*

## COLORADO.

## SUMMARY.

*Temperature.*—Monthly mean, 45.2; highest monthly mean, 56.0, at Magnolia; lowest monthly mean, 20.4, at Dolly Varden Mine; maximum, 88.0, at Longmont, 22d; minimum, —15.0, at Hartsel, 19th; range for state, 103.0.

*Precipitation.*—Average for the state, 1.73; greatest, 4.61, at Paoli; least, 0.54, at Glenwood Springs.—*Prof. F. H. Loud, Colorado Springs, director; T. W. Sherwood, Sergeant, Signal Corps, assistant.*

## ILLINOIS.

## SUMMARY.

*Temperature.*—Monthly mean, 52.9; maximum, 86, at McLeansborough, 18th; minimum, 22, at Aledo, 4th, and at Pontiac, 6th; mean of maximum, 78.2; mean of minimum, 27.7.

*Precipitation.*—Average for the state, 1.96.

*Wind.*—prevailing directions, northwest and northeast.—*John Craig, Sergeant, Signal Corps, Springfield, in charge.*

## INDIANA.

The month of April, 1889, was exceedingly dry; small amounts of rain fell everywhere only on a few days. The deficiency of the amount for the state is nearly 2.00; the greatest deficiency occurred in the southern portion, and the least in the northern. The amounts measured during April, 1889, were the smallest in that month during the past ten years or more. The rains during the passage of the low areas of the 1st and 2d, 11th, 12th, 19th, and 24th, were accompanied by thunder-storms and hail; the hail which fell on the 12th was of large size, and fell in great quantities at many stations. Snow fell only in the northern portion on the 1st, 4th, 5th, and 6th, in small quantities.

The temperature was nearly normal; slightly above in the central, and slightly below in the northern and southern portions. The highest temperature was noted in the southern portion, 11th, in the central portion 19th, and on the 12th in the northern portion. The lowest was noted nearly everywhere, 6th. The range was uniformly 54 in all portions of the state. The